

## REMARKS

1. Applicant gratefully acknowledges the Examiner's withdrawal of the previous rejections.

### **Claim rejections – 35 USC § 103**

2. Applicant acknowledges the Examiner's rejection of claim 1 under 35 U.S.C. § 103(a) as unpatentable over Ueda et al. ("Noise and Life of Helical Timing Belt Drives") and further in view of Araki et al. (US 4,840,608), but respectfully traverses this rejection.

Regarding **claim 1**, the Ueda et al. does not explicitly disclose the range of the claim limitation of the parameter " $1-W \tan \theta/Pt$ ", namely from -0.2 to 0.75. However, Ueda does disclose a helical toothed belt with a width of 20 mm, pitch of 8 mm, and helical angle of  $10^\circ$ , which would fall within the claimed range.

The Examiner acknowledges that Ueda et al. does not disclose the claim limitation for the range of backlash, namely "*from 1.6 to 3% of said tooth pitch*". The Examiner points out that Araki et al. discloses backlash of 0.15 mm for a belt of pitch 9.525 mm in Table 2, column 4. The Applicant respectfully points out, that Araki does not appear to provide an unambiguous definition of "backlash," in particular failing to define whether it is based on total backlash or a half-tooth backlash as in Fig. 3 of the Applicant's specification. Without a clear definition, Araki's disclosure is not enabling.

Furthermore, Araki's backlash is a "maximum backlash" evaluated at a "maximum backlash position ( $H_1/W$ )" as indicated in Table 2, Fig. 7, and col. 4 lines 64-69. Applicant's backlash is evaluated at a half-height position (see Fig. 3 and specification page 7 lines 8-25). This is significant because Applicant's definition will result in a much smaller value of backlash than Araki's "maximum backlash." The farther Araki's "maximum backlash position ( $H_1/W$ )" is from the half-height position of Applicant (i.e., the smaller the  $H_1/W$  ratio), the smaller will be Araki's backlash value when re-calculated according to Applicant's definition. Thus, assuming for the sake of argument that Araki is talking about the same half-tooth backlash definition as Applicant, the value of maximum backlash for tooth shape (1) in Table 2 is  $0.15/9.525 =$

1.57% which is not in the claimed range 1.6 to 3.0%. Moreover, the location of the maximum is at  $H_1/W=0.21$ , so the backlash per Applicant's definition could easily be estimated at about 1/3 less than the value cited by Araki, based on the wedge shape of the gap between belt tooth and pulley groove as shown in Applicant's Fig. 3.

Even if, for the sake of argument, Araki teaches a backlash "close" to Applicant's range, this teaching would still not support a prima facie case of obviousness because Araki teaches that a smaller backlash is better, and Applicant's range is larger. (See e.g., *In re Pearson*, 494 F.2d 1399, 1404 (CCPA 1974). ("In our opinion the alleged prima facie case of obviousness was never established" because the prior art taught a particle size less than the claimed range and that smaller was better.) Araki teaches away from a larger backlash in col. 1 lines 50-53, "there is known an improved arcuate tooth in which the difference between the tooth shape and its envelope is made as small as possible so as to reduce the backlash of the arcuate tooth." (emphasis added). This teaching is born out in Table 2 example (4) which has a maximum backlash of 0.05 mm at a position of 0.43. This calculates to a maximum backlash of 0.52% at a position much closer to half-height of the tooth.

So, not only does Araki's teaching not fall within Applicant's claimed range of backlash, regardless of definition of backlash, but also Araki teaches away from Applicant's range, teaching that an improved tooth is made with a gap "as small as possible so as to reduce backlash." Furthermore, other problems could be mentioned, such as a lack of suggestion that backlash of a straight-tooth timing belt would be applicable or result effective in a helical-tooth timing belt. Therefore, Applicant respectfully submits a prima facie case has not been made, and withdrawal of the rejection of claim 1 is respectfully requested.

3. Applicant acknowledges the Examiner's rejection of claim 2 under 35 U.S.C. § 103(a) as unpatentable over Ueda et al. ("Noise and Life of Helical Timing Belt Drives") and further in view of Takehara et al. (US Pub. No. 2005/96433A1), and Wujick (US 4,403,979), but respectfully traverses this rejection.

Applicant respectfully points out that Takehara et al. is not prior art for the present application. Takehara et al. was published on May 5, 2005, while the Effective

Filing Date of the present application is the International Filing Date of the International Application, namely 4/2/2004, (see 35 U.S.C. § 363) and priority is claimed to a prior national application dated 4/3/2003.

Therefore, no reference cited teaches the limitation " $1-W \tan \theta/Pt \leq 0$ " as claimed. Some of the prior arguments about Wujick also still apply to this rejection. Thus, there is no reason for one of skill in the art to combine Wujick and Ueda et al. Wujick does not mention anything about helical-tooth drive systems, or about noise or vibration problems, so there is no reason for the Applicant to turn to Wujick to solve his problem. In light of all these remarks, withdrawal of the rejection of claim 2 is respectfully requested.

4. Applicant acknowledges an additional prior art reference made of record but not relied on by the Examiner. The Yoshida et al. reference (JP2000-320626) is felt to be no more pertinent to the claimed invention than those relied on by the Examiner. Yoshida does not appear to mention helical belts, appears to teach a very high value of backlash, outside the range of claim 1, and to teach the same belt width and pitch as Ueda et al., outside the range ( $1-W \tan \theta/Pt \leq 0$ ) of claim 2. Yoshida's compression range appears to be similar to Wujick.

#### FEE STATEMENT

Any fees which may be required as a result of the remarks made herein, are authorized to be charged to Assignee's deposit account number 07-0475.

In light of the forgoing amendments and remarks, favorable reconsideration of the allowability of both claims is respectfully solicited.

Respectfully submitted,  
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Dated: June 14, 2010